Department of Radiology

Kunihiko Fukuda, *Professor*
Shunichi Sadaoka, *Professor*
Mayuki Uchiyama, *Professor*
Norio Nakata, *Associate Professor*
Masao Kobayashi, *Assistant Professor*
Toru Sakuma, *Assistant Professor*
Hiroshi Sekine, *Professor*
Manabu Aoki, *Professor*
Hiroya Ojiri, *Associate Professor*
Yoshimitsu Sunagawa, *Assistant Professor*
Mitsuko Ariizumi, *Assistant Professor*
Go Kawakami, *Assistant Professor*

Research Activities

Division of diagnostic imaging

1. Differentiating between glioblastomas with and without isocitrate dehydrogenase (IDH) gene mutant from the imaging findings

Along with the revision of the 2016 WHO classification of tumors of the central nervous system, molecular genetic parameters began to be used. In particular, the presence or absence of IDH gene mutation is one of the important elements in glioma classification. We examined whether the imaging findings can differentiate between glioblastomas with and without IDH gene mutation.

2. Evaluation of availability of Computed Tomography (CT) scoring system to detect metastatic nodal disease in patients with head and neck cancer

Nodal status is the most important prognosticator for patients with head and neck cancer. Although there are many CT criteria of metastatic adenopathy such as size, shape and internal morphology, how to determine positivity is quite subjective. We propose CT scoring system as an objective criterion and evaluate its availability.

3. Evaluation of the coronary vasculitis and peri-vasculitis using Electrocardiogram(ECG)-gated Multidetector row CT(MDCT)

The coronary vasculitis and perivasculitis are noticed as the complications of the various systemic disease: systemic vasculitis such as Takayasu arteritis、autoimmune disease such as systemic lupus erythematosus, lymphoproliferative disorder such as Immunoglobulin G(IgG)4-related disease, and so on. We examine the diagnostic utility of the ECG-gated MDCT in the evaluation of the coronary vasculitis and perivasculitis.

4. Airspace enlargement (AEF) is a recently recognized entity as a smoking related change, although the mechanism of forming thin-walled cysts are still unclear

We hypothesized that repeated transformation of cysts during respiration may one of the cause of forming AEF and compared the size change of cysts between AEF, bullae and honeycombing in respiration using inhalation and exhalation CT.

5. Evaluation of ultrasonic fusion images of breast lesions using Volume Navigation (V-NAVI)

It is possible to evaluate fusion images with ultrasonic / ultrasonic in real time during ultrasonic examination by using V-NAVI in which 3D-US images with GPS is acquired in advance. We evaluated both the fusion images of breast lesions and the utility of V-NAVI.

6. Evaluating the malignant potential of intraductal papillary mucinous neoplasms of the

pancreas (IPMN): Added value of non-enhanced endoscopic ultrasound to supplement non-enhanced MRI
Data from 38 patients histopathologically diagnosed with IPMN adenomas or IPMN adenocarcinomas were retrospectively analyzed. The diagnostic value of combined use of non-enhanced MRI and non-enhanced EUS were evaluated, as opposed to non-enhanced MRI alone.
7. MRI-US fusion imaging for the evaluation of placental invasion
We performed MRI-US fusion of the placenta in patients with suspected placental invasion, and explored the relation between MRI and US findings by MRI-US fusion.
8. Usefulness of Dual Energy CT (DECT) with Iodine MAP for the evaluation of hand psoriatic arthritis (PsA); comparison study with contrast enhanced MRI
To evaluate the usefulness of DECT for hand (PsA), we compared the DECT findings with contrast enhanced MRI.

Division of Ultrasound
9. Differentiation between benign and malignant breast lesions on contrast-enhanced sonography with quantitative analysis was performed
Kinetic analysis using contrast-enhanced sonography is useful for differentiation between benign and malignant breast lesions.

Division of Nuclear Medicine
10. Physiological change of accumulation in I-123 IMZ brain single-photon emission computed tomography (IMZ SPECT) appeared during childhood
Physiological regional accumulation shows change dramatically during childhood especially under 2 years old. The aim of this study was to compare regional accumulation in brain on anatomically standardized IMZ SPECT images.

Division of Interventional Radiology
11. Balloon-occluded Retrograde Transvenous Obliteration(BRTO) for gastric varices: Efficacy of Coaxial Double-balloon Catheter System (CDBCS)
CDBCS comprises a 9-Fr guiding balloon catheter that has a stiff shaft and a 5-Fr coaxial balloon catheter with a flexible shaft. In BRTO, this system can be more easily advanced proximally to the gastric varices beyond the outlet of the collateral veins. We investigated the efficacy of CDBCS compared with that of conventional single-balloon catheter system in BRTO of gastric varices.

Division of Radiation Therapy
12. Development of non-invasive quantitative evaluation for skin reaction of irradiation
Since the skin reactions associated with radiotherapy is quantitatively evaluated, objective evaluation is difficult between observers. The purpose of this study is to verify whether the change of skin reaction associated with radiotherapy using non-invasive quantitative methods objectively evaluate.

Publications

Yamauchi H, Buehler M, Goodsitt MM, Keshavarzi N, Srinivasan A. Dual-Energy CT-Based Differentiation of Benign Posttreatment Changes From Primary or Recurrent Malignancy of the Head and Neck: Comparison of Spectral Hounsfield Units at 40 and 70 keV and Iodine Concentration. *AJR Am J Roentgenol.* 2016; **206:** 580-7.

Baba A, Ojiri H, Dogru M, Tanaka Y, Takahashi S, Mogami T, Kobashi Y, Yamazoe S, Nozawa Y, Ogino N, Yamauchi H, Aoyagi Y. An Unusual Clinical Presentation of Kimura Disease Manifesting with a Typical Cephalocervical Lesion and an Atypical Subcutaneous Hip Mass Lesion. *Internal Medicine.* 2016; **55:** 1017-20.

Igarashi T, Ashida H, Morikawa K, Motohashi K, Fukuda K. Use of BI-RADS-MRI descriptors for differentiation between mucinous carcinoma and fibroadenoma. *Eur J Radiol.* 2016; **85:** 1092-8.

Ouchi K, Sakuma T, Kawai M, Fukuda K. Incidence and appearances of coronary sinus anomalies in adults on cardiac CT. *Jpn J Radiol.* 2016; **34:** 684-90.

Michimoto K, Shimizu K, Kameoka Y, Sadaoka S, Miki J, Kishimoto K. Transcatheter Arterial Embolization with a Mixture of Absolute Ethanol and Iodized Oil for Poorly Visualized Endophytic Renal Masses Prior to CT-Guided Percutaneous Cryoablation. *Cardiovasc Intervent Radiol.* 2016; **39:** 1589-94.

Fukuda T, Umezawa Y, Tojo S, Yonenaga T, Asahina A, Nakagawa H, Fukuda K. Initial experience of using Dual Energy CT with Iodine overlay image for hand psoriatic arthritis: comparison study with contrast enhanced MRI. *Radiology.* 2017; **284:** 134-42. Epub 2017 Jan 3.